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TREE CLEARING AND THINNING IN QLD DESERT UPLANDS: ONE OPTION IN THE QUEST FOR VIABILITY

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ABSTRACT

As part of a larger project to determine “the production and biodiversity costs and benefits of woodland thickening and mechanical thinning in the Qld Desert Uplands”, data was gathered from four properties around Torrens Creek and Prairie in Flinders Shire, north-west Qld.

The study properties were all less than a “living area” as per NRM&M standards (1998). Individual property owners have addressed inadequate property size, and hence inadequate income, through a variety of strategies including off-property employment, buying or agisting additional land, improved husbandry practices, and property development, including clearing and thinning trees.

Of the clearing and thinning strategies considered, clearing of gidgea scrub to establish buffel grass pastures proved highly profitable. Thinning undergrowth from eucalypt woodlands was in one instance financially successful and in another unsuccessful.

INTRODUCTION

Recent changes to vegetation management regulations in Qld have focused attention on the cost to producers of lost clearing opportunities, and of future costs associated with woodland thickening. A draft report (McCullough et al 2004) for the Productivity Commission, estimates net present value to producers of future production losses from woodland thickening at \$216 to \$219 million, on a 2004 base of 2.13m cattle equivalents.

Whilst the original objective of the Desert Uplands project was to evaluate costs and returns of clearing and thinning, it soon became clear that land development was only one of several options available to landholders seeking to achieve viability.

METHOD

The four study properties were selected on the basis of their suitability for biodiversity studies, with various prior land development histories – cleared, thinned and untreated. Economic data was collected to determine the profitability of clearing and thinning.

A case study approach was used, comparing what happened physically and financially after clearing or thinning versus what might have happened without treatment. Herd modelling using Breedcow and Dynama software (Holmes 2005) is based on owners’ estimates of branding rates, turnoff weights and changes to carrying capacity, all at 2005 prices.

Business growth for each property was described to show how property development by modifying vegetation is one means among several of maintaining business viability.

DEVELOPMENT HISTORIES

Buffel pasture on cleared gidgea

In 1983 this 12,500 ha property was purchased from family, and another 2,600 ha of downs country purchased as a fattening block.

Between 1995 and 1999, 10,400 ha of gidgea/ironbark country were cleared and sown to buffel grass. The progressive establishment of the buffel pastures increased carrying capacity and enabled turnoff at heavier weights. Carrying capacity in the undeveloped state was 900 adult equivalents (AE) turning off 175 weaner steers for fattening on the downs block. After development this increased to 2,500 AE turning off 400 feedlot steers at 400 kg liveweight, and the downs block was no longer required. In addition, branding rates increased 30 percentage points, from approximately 50% to 80%, due to better quality pastures. The downs block was at first agisted, and then in 2001 sold.

Discounted cash flow analysis of development costs and benefits indicates a pre-tax return (IRR) on extra capital of 28% for a 10 year “life” of the development and 30% for a 20 year “life”, not counting enhanced property value from development. The scale of the improvement was such as to turn the property into a totally viable operation.

Thinning with Crocodile seeder and sowing buffel #1

This 6,400 ha Prairie property was purchased in 1993 with compromised land condition, principally relating to pasture composition and understory thickening. Steps taken to restore land condition included wet season spelling and tree thinning.

In 2000, an area of 800 ha of ironbark country was selectively thinned and oversown with buffel grass using a “crocodile” seeder. The crocodile seeder is a two tonne implement, 5 metres wide, drawn by a D8 Caterpillar tractor, which knocks over and uproots saplings and woody understory species (esp *carissa*) while pitting and otherwise breaking up the soil surface.

The crocodile was pulled slowly (2nd gear, covering 8-10 acres/hr) and was successful in uprooting saplings up to 100 or 150 mm in diameter. Buffel seed was spread at the same time. Mature trees were left. The result is a treed landscape with vigorous pasture comprising native species interspersed with buffel.

The thinned paddocks are opportunistically “wet season spelled”.

The carrying capacity of the treated area was assumed to occur in stages, lifting from nil to one AE per 8 ha in year 2, and thereafter progressively to 1:6 in year 6. While the owner thought that with careful management, a further increase to 1:4 was possible, there may also be some recovery of tree basal area from sapling regrowth and ongoing growth of mature trees left by the thinning. After five years, apparent sapling regrowth is modest. To cover the range of possibilities, analysis periods of 15 and 25 years are used. Results are in Table 1.

Table 1: Likely Economic Benefits from Tree Thinning

Life of treatment	15 years	25 years
IRR	12.5%	14%
Annual equivalent return	\$8,000/yr for 15 yrs	\$13,600/yr for 25 yrs

This analysis shows that tree thinning, combined with wet season spelling has been a reasonable investment, and a contribution towards making the property more viable, however further such development is prevented by current vegetation management regulations.

In 2003, a neighbouring property of 7,000 ha was purchased.

Thinning with Crocodile seeder and sowing buffel #2

In 1987 this 8500 ha property was purchased from family. It is run in conjunction with an 8,000 ha “downs” property used for fattening.

In 2002, 400 ha of ironbark country was thinned and oversown with buffel grass using a crocodile seeder. This was to provide a public demonstration of thinning methods. The landholder did not consider tree treatment conditions to be ideal at the time and made the following observations:

- Special thinning permit timeframes were not flexible enough to cope with seasonal conditions
- Soil conditions were very dry at the time making tree removal difficult
- Machine operating speed was determined by budget and time constraints (aimed to maximise ha/hour)
- Trees snapped off or were laid over rather than being fully removed from the ground
- Trees have sprouted from stumps and logs to a height of approximately 4m within 4 years
- Treated areas are in close proximity (within 2 km) to cattle watering points
- Special management of the thinned areas post-treatment was not possible due to infrastructure limitations

Carrying capacity of the treated area was assumed to increase from the original 1:16, to 1:8 in years 2 to 6, then return to 1:16 by year 11. Based on visible regrowth after 4 years, the thinning treatment was assumed to require re-thinning within 10 years. Analysis based on a 10 year treatment life indicates IRR of negative 2%.

The owners have since sold their off-property business and are looking to buy more land.

No timber treatment

The fourth property, comprising 16,400 ha plus 2,000 ha of stock route, was purchased from family in 1982. Carrying capacity is approximately 1,200 AE. Development has been focused on additional waters and fencing. For a time, some “downs” country was agisted to fatten steers, but this was given up when it became too expensive. The property has been run in association with a bore sinking business. At the time of interview, the owner was considering buying another 46,000 ha of light carrying country, but has since decided not to.

PROPERTY SIZE AND ENTERPRISE VIABILITY

NR&M living area standard (1998) for Flinders Shire “open ironbark forest with gidgee, bauhinia influence” is 2,500 – 3,000 cattle. For the inferior “ironbark, yellowjack, Spinifex desert areas of heartleaf poison” it is 2,700 to 3,500 cattle.

A living area is defined as “...the area of grazing ... land that will be adequate to enable a competent person to derive from the working of the land an income adequate to ensure a reasonable standard of living for the person, the person’s spouse and dependent children”

Prior to development, all properties fell short of the NRM&M living area standard. After development, only the property with extensive clearing of gidgea had clearly achieved the NRM&M standard. Others will achieve the standard through the purchase of additional land.

These standards are based on the property being the sole source of employment for the family, which clearly it often is not. All four properties in this study at some time resorted to off-property employment to make up the “viability” shortfall.

ACHIEVING VIABILITY

Methods of achieving viability when property size and/or quality are initially inadequate include:

- Purchasing (or leasing) more land locally (i.e. of the same type);
- Purchasing (or leasing) fattening country, usually remote from the home property;
- Developing country by clearing, thinning or seeding;
- Developing by fencing and the provision of extra water points;
- Improving livestock performance through husbandry or breeding innovations; and
- One or more members of the family working off the property.

If starting from a low base, capital is almost always limiting. Purchasing more land requires large amounts of (borrowed) capital all at once, and this hurdle may be insurmountable. Leasing or agisting country avoids the large capital expenditure, and may enable a progressive build up of cattle numbers in anticipation of an eventual purchase.

Developing country can be done and financed in stages of as little as a few thousand dollars. Husbandry improvements can be made incrementally, and do not require extra livestock.

Working off the property can be wages work or running another business. Off-property work, by reducing the labour available for stock work, may also affect how the cattle are managed.

Circumstances and strategies employed by the study properties are shown in Table 2.

Table 2: Comparison of Case Study Properties

Property	A	B	C	D
Base area (ha)	12,500	6,400	8,500	18,400
Year of purchase	1983	1993	1982	1982
Additional area (AA)	2,600 ha (sold 2001)	7,000 ha (bought 2003)	8,000 (since 1980)	Agistment for 300-400 steers, 2001-2003
Distance to AA	300 km	Joining	160 km	300 km
AA post 2005	Nil	Nil	Looking	Considered adjoining block
Carry Capac 1995	1,200	1,240	1,300	1,200
CC 2005 with devt	2,500	1,370	1,325	1,200
CC post 2005	2,500	1,900	1,300	1,800
Branding %	50% → 80%	66%	72%	54%
Steer turnoff	400 kg @ 2yr	400 kg @ 2yr	225 kg @13m	180 kg @ 10m
Gross margin/AE	\$203	\$147	\$138	\$121
Timber development	Cleared 10,400 ha 1995 – 1999	800 ha Crocodile 2000	400 ha Crocodile 2002	Nil

Property	A	B	C	D
Future development	See below	Purchased neighbouring property 2003	Sold carrying business 2005. Looking for more land. Also see below.	Additional stock water points and dam cleaning.
Vegetation Management compensation (\$100,000)	Applied for stylo development and fencing.	Will apply for new stock water and fodder storage facilities.	Applied to buy buffel seed for red sandy country and to put in laneways.	Received compo to buy front end loader for dam cleaning, also poly tanks and troughs.
Other employment	Local PO & phone exchange 1976-1986	Dozer hire incl laying pipelines & fencing	Trucking business (sold 2005) for 40 wks/yr.	Bore sinking business (1/3 of yr)

Table 1 reveals the generally inadequate starting size of the study properties, and the strategies employed by owners to ensure viability. In all instances, property income has been supplemented with off-property work. All have combined, or are about to combine, their properties with another block through purchase or agistment – better “downs” country some distance away or more of the same but close by for easier management. Three of the four have cleared or thinned, while the fourth has developed by putting in more waters and fences.

CONCLUSIONS

Unifying themes for the four properties in this project were the historical inadequacy of property size and the need for fattening country.

Clearing gidgea and establishing buffel grass was highly successful, enabling an increase in carrying capacity while turning off fat cattle. The analysis indicates almost a quadrupling of property gross margin and a return on additional investment (IRR) of 28-30%. This development transformed the property into a viable stand-alone operation.

Thinning with the crocodile seeder was successful for one property, but not for the other, suggesting that thinning timing and method and post-thinning management are critical.

In response to inadequate property size (or stock numbers), owners have ensured a return on their own time through a variety of means. All have had off-property employment, and all have had or are considering buying additional areas.

In the face of more restrictive vegetation management regulations, woodland thickening can be expected to diminish carrying capacity of Desert Uplands properties. Maintaining or achieving viability will mean an increased focus on land purchase or agistment in conjunction with improved cattle husbandry, development other than clearing or thinning, and a continuation of income-seeking off the property.

Even with these other options for business growth, woodland thickening will progressively render existing and new Desert Uplands properties less productive pastorally, hinder the implementation of progressive cattle husbandry, and make properties more costly to run.

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